# CLAIMS

What is claimed is:

1. A method for producing a microbial oil, comprising:

inoculating a *Schizochytrium* strain into a fermentation medium for fermentation and subjecting a product of the fermentation to extraction to produce the microbial oil;

wherein the *Schizochytrium* strain is *Schizochytrium* sp. GDMCC No. 60733;

the fermentation is carried out at pH 6-7.5 and 27-31°C for 4-8 days under a ventilation rate of 0.45-1.1 vvm;

the fermentation medium comprises 5-70 g/L of a carbon source, 15-45 g/L of a nitrogen source, 5-40 g/L of an inorganic salt, 0.01-0.04 g/L of a trace element and 0.01-0.04 g/L of a vitamin;

the nitrogen source comprises glutamate; and a concentration of glutamate in the fermentation medium is 5-15 g/L.

2. The method according to claim 1, characterized in that the method comprises:

inoculating the *Schizochytrium* sp. GDMCC No. 60733 into an activation medium for activation to obtain an activated *Schizochytrium* suspension;

inoculating the activated *Schizochytrium* suspension into a seed culture medium for expansion culture to obtain a seed liquid; and

inoculating the seed liquid into the fermentation medium for the fermentation to produce the microbial oil;

wherein the activation is carried out at 27.5-28.5°C and 150-200 r/min for 48-72 hours;

the activation medium comprises 30-50 g/L of a carbon source, 25-45 g/L of a nitrogen source, 25-40 g/L of an inorganic salt, 0.015-0.025 g/L of a trace element and 0.01-0.02 g/L of a vitamin;

the expansion culture is carried out at 27-28.5°C under a ventilation rate of 0.5-0.8 vvm for 48-72 hours; and

the seed culture medium comprises 25-60 g/L of a carbon source, 10-30 g/L of a

nitrogen source, 15-35 g/L of an inorganic salt, 0.01-0.02 g/L of a trace element and 0.01-0.02 g/L of a vitamin.

3. The method according to claim 1 or 2, characterized in that the carbon source in the fermentation medium, the carbon source in the activation medium and the carbon source in the seed culture medium are independently selected from the group consisting of glucose, sucrose and a combination thereof;

the nitrogen source in the fermentation medium, the nitrogen source in the activation medium and the nitrogen source in the seed culture medium are independently selected from the group consisting of sodium glutamate, yeast powder, yeast extract and a combination thereof;

the inorganic salt in the fermentation medium, the inorganic salt in the activation medium and the inorganic salt in the seed culture medium are independently selected from the group consisting of calcium salt, phosphate, potassium salt, sodium salt, magnesium salt, ammonium salt and a combination thereof;

the trace element in the fermentation medium, the trace element in the activation medium and the trace element in the seed culture medium are independently selected from the group consisting of nickel, copper, molybdenum, cobalt, zinc, iron, manganese and a combination thereof; and/or

the vitamin in the fermentation medium, the vitamin in the activation medium and the vitamin in the seed culture medium are independently selected from the group consisting of vitamin $B_1$, vitamin $B_{12}$, vitamin $B_6$, calcium pantothenate, biotin and a combination thereof.

4. A *Schizochytrium* strain, characterized in that the *Schizochytrium* strain has an accession number of GDMCC No. 60733.

5. The *Schizochytrium* strain of claim 4 for use in the production of a microbial oil, characterized in that the microbial oil comprises a triglyceride;

wherein Sn-2 fatty acids of the triglyceride comprise 23% or more by weight of DHA; and

a weight percentage of total DHA in the microbial oil is not less than 38%.